

# ENTREPRENEURIAL EDUCATION IN PRACTICE

PART 2 - BUILDING MOTIVATIONS  
AND COMPETENCIES

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## ENTREPRENEURSHIP360 THEMATIC PAPER

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# THEMATIC PAPER ON ENTREPRENEURIAL EDUCATION IN PRACTICE

PART 2

BUILDING MOTIVATIONS AND COMPETENCIES



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## INTRODUCTION

1. Entrepreneurship education has emerged in different educational contexts, primarily to develop an entrepreneurial culture, to create new ventures and to foster entrepreneurial mindsets through education and learning (Kuratko, 2005). In early work a common theme was to simply consider business start-up as a valid outcome, irrespective of how successful the new venture was or how useful the learning that accompanied it entailed. In recent years a raft of research and more developed expertise has evolved to better inform the education community, and as a result many new theories and approaches have evolved that break down various aspects that are deemed to be important factors in learner development and perhaps importantly, how this can be enhanced through appropriate assessment of student performance. However, much of this activity can still be considered to be at a relatively early stage of development and the many and varied alternative definitions and interpretations of what is meant by the word "entrepreneurship", across the globe continue to cause confusion.

2. The words of Klaus Schwab, the founder and Chairman of the World Economic Forum (2009, 6) help us to understand what is required: "*Entrepreneurship is the engine fuelling innovation employment generation and economic growth... the power that education has in developing the skills that generate an entrepreneurial mindset and in preparing future leaders for solving more complex, interlinked and fast-changing problems*". From this key aims emerge and the underlying picture of an education system that enables adaptability (to address fast changing problems), develops capacity for opportunity recognition and networking (to address complex and interlinked issues), and ensures that these skills are aligned to the needs of business and economic growth, become paramount. We must however, be cautious that these are not seen to neglect aspects of community needs and social entrepreneurship, so sustainable business that addresses needs other than pure profit also need to be factored into the discussion.

3. In their consultation with 31 participating countries, the 2011 Eurydice survey on Entrepreneurship Education showed that two thirds of European countries explicitly recognise entrepreneurship in central steering documents at primary education level. This rises significantly in secondary education, where virtually all countries integrate entrepreneurship into the curriculum in some form. The learning outcomes generally cover aspects relating to three dimensions of entrepreneurial attitudes, knowledge and skills. In primary education, half of the countries define learning outcomes as being related to entrepreneurial attitudes and transversal entrepreneurial skills. "No country addresses practical entrepreneurial skills at this school level" (European Commission, 2012, 29). At secondary level most countries cover at least two dimensions with many covering all three. Whilst this illustrates the acknowledged need for development, it rarely takes into account the immediate needs of the educators charged with delivery.

4. Entrepreneurship isn't general business or economic studies. The aim is to promote creativity, innovations and self-employment (European Commission, 2009). Yet, mainly within the University sector Business Schools have been the traditional providers of entrepreneurship education. Similar scenarios exist in secondary level schools where the Business Studies tutor is frequently charged with entrepreneurship provision.<sup>1</sup> There is much to learn from looking beyond educational

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<sup>1</sup> The authors of this paper have been directly engaged in this debate for some years, through the UK Higher Education Academy, the United Nations Conference on Trade and Development and through Thematic Working Groups set up by the DG Enterprise and DG Education and Culture at the European Commission.

practice in business-oriented subjects, however in much of the debate thus far these approaches have been deemed to be novel, despite their widespread use and adoption beyond the business school environment. For example, the aim of design education is to develop learners who are capable of managing and developing innovative output in situations of ambiguity and risk, and performing arts or music students are conversant with assessment strategies that engage audiences through emotion and aspects of persuasion (e.g., Penaluna et al., 2010; Neck and Green, 2011).

5. Whilst the European Commission (2013b, 3) advocate that "All young people should benefit from at least one practical entrepreneurial experience before leaving compulsory education", there are currently no definitive pedagogical guidelines for entrepreneurship education within schools. Nor is there any guidance similar to the UK's University Quality Assurance Guidance (QAA, 2012)<sup>2</sup> that explicitly defines the distinctions between broader and more focused entrepreneurial skills<sup>3</sup>. Teachers, therefore, face considerable challenges, not only in identifying appropriate contents and delivery methods for entrepreneurship education (Seikkula-Leino, 2008) but also to respond to the remit of national and international strategies (Ruskovaara and Pihkala 2012).

6. It should also be noted here that entrepreneurship does not have to be a specific school subject, but can also be a teaching method that embraces experiential learning and project work (European Commission, 2013a). Whilst this concept fits well with contextual learning that brings entrepreneurship into every topic, it exacerbates the problems and issues surrounding the evaluation and assessment of student learning, especially when it is expected to be developed within a commercially aware entrepreneurial learning environment. The term "commercially aware" is important to consider, as sustainability is reliant on good sense making and thinking from outset. Moreover, if issues surrounding finance and viability are not considered as an integral element of the learning, we may only be looking at impractical ideas generation as opposed to any form of realistic problem solving. This is not to say that broad idea generation is not desirable and that it should not lead the thinking process, instead, once ideas have been developed, they should be evaluated against realistic constraints and scenarios.

7. From an educational perspective, there is general consensus with the recommendations of the Oslo Agenda for Entrepreneurship Education in Europe, which is to "embed in Schools and Higher Education elements of entrepreneurial behaviour (curiosity, creativity, autonomy, initiative, team spirit) already in primary school education".<sup>4</sup> However, whilst these skills are deemed essential, they are not the complete picture – as aligning the learning with the associated aspects of sustainable business and economic growth need to be drawn out and clarified. This is where the extended network can inform the process, as teachers, school principals and policy makers, can readily consider the type and nature of stakeholder engagement that has led to the education activities that they will propose.

8. Retaining the creative thinking of the young mind is important and real world relevance and levels of connectivity will help to bring invaluable insights to our schools. Student assessment in recent years has been very focused on hard and measureable / comparable outcomes, at the expense of contextualised learning that is suited to an entrepreneurial purpose. We also expect that the new learning environment will need to evolve, and in effect, become role model institutions that practice

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<sup>2</sup> <http://www.qaa.ac.uk/en/Publications/Documents/enterprise-entrepreneurship-guidance.pdf>

<sup>3</sup> Please note that the UK's QAA Guidance also has bearing on teacher training within the University sector, hence it also drives the development of new teacher training provision – for all levels of education.

<sup>4</sup>

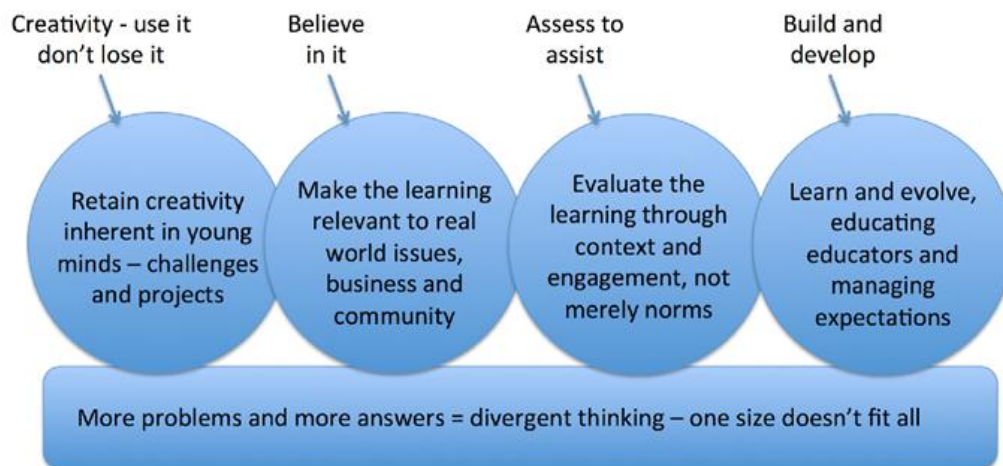
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what they preach. This may involve "glorious failures" a term that accepts that many new interventions will be prototypes – where for both students and educators, the experience will be as valid as the immediate outcome. Moreover, for entrepreneurship education to become a tool that enhances the capability of young people to be more entrepreneurial, it must be incorporated into all forms of learning, education and training - from all levels of education from nursery through to higher education, and whilst it can be considered as a general set of competencies for all walks of life, inclusive of, but not just about learning how to run a business (European Commission, 2013a), the universally accepted business start-up metric is only one tangible measure of the success of an entrepreneurship education intervention. We therefore need to think deeper in order to draw out tangible learning that can be evaluated and assessed in a progressive manner in the classroom.

9. During our research some key themes emerged that are particularly relevant to understand, from both a teacher's perspective and that of the school principals, which in turn will help policy makers to enhance their own understanding in a way that develops new opportunities and appropriate capacities. These themes will be discussed in this paper.

10. The model below (Figure 1) helps to clarify this thinking, and will be referenced throughout our discussions in this paper. Each of the parts of the model will be unpacked in dedicated sections to consider how they may impact on practice, and suggesting how they may be used as a means to evaluate progress.

**Figure 1. Model of entrepreneurial education**



Source: Penaluna and Penaluna in this paper.

11. We will start each section with a table/checklist of key issues that will be discussed and present a list of key questions for teachers, school principals and policy makers to raise further actor-specific questions that will guide the reading.



## CREATIVITY, USE IT DON'T LOSE IT

### Introduction and key issues

11. If we consider that Simonton (1999) estimated that it takes around ten years to learn the ideas and skills that one needs to think of creative ideas, infrequent brainstorming, and similar "creativity exercises" may be a misdirected approach, ones that do not take account of current thinking that suggests that frequency is as important as the exercise itself; it has more in common with the continuous and developmental coaching of an athlete than a periodic attempt to practice something. Moreover, because any formula or routine may have to change due to evolving circumstances, it is often overlooked that students may have to "unlearn" things that were previously valid, and that unlearning is often a pre-requisite to seeing things in new ways McWilliam (2008). To the teacher and the school principal, this means that in order to see things in new ways, we also need to be able to discard thinking that is no longer useful.

12. This has particular resonance when we consider facts and priorities that impact on the learning, but may well have changed or become invalid. In some cases this means unearthing hidden assumptions. For example, the Space Shuttle booster rocket designs were based on the assumption that they had to be recycled and transported back to base by rail, so we come to understand that railway line width and tunnel size significantly limit new design opportunities on the rockets. Indeed, the railway line width can be linked back to cart and chariot designs, because the optimum width for a cart or similar vehicle was based on two horses harnessed together for maximum pulling power. Hence we illustrate that the design of the Space Shuttle's rockets was predicated by the need to work to the width of two average horses. This is an assumption that many would miss. Rekindling the curious learner's questioning and offering chances to ask, but why, why, why, is one way of overcoming such inhibitions – through the challenging of norms and what is often considered to be valuable but naive inquiry. Simply ask, why do we do it this way?

13. Table 1 gives an overview of the key issues discussed in this section and presents a list of key questions for teachers, school principals and policy makers to raise further actor-specific questions that will guide the reading.

**Table 1. Key issues and questions for teachers, school principals and policy makers**

Key issues	Questions
<ul style="list-style-type: none"> <li>• Become a "Reasonable Adventurer"</li> <li>• Be aware that emotion impacts on creative capacity development</li> <li>• Develop "Knowledge Harvesters", not just knowledge retainers</li> <li>• Confusion and ambiguity in learning is an essential component of sense making for the learner.</li> </ul>	<p>Are <b>teachers</b> developing curriculum that genuinely puts the learner in the driver's seat, enabling pupils and students to make mistakes and to learn from them, retaining learning environments that encourage creativity – through an understanding of the role of emotion in learning?</p> <p>Are <b>school principals</b> embracing this shift in the role of the teacher, supporting educators who embrace these methods and actively facilitating the required / contextualized learning environments?</p>

- Start to balance norm evaluative methods with contextualised evaluative methods
- Reward "Glorious Failure" through experimentation, not merely final outcomes
- Retain young brain thinking through continuous creativity exercises

Are **policy makers** informed as to how teaching and learning for creativity works, supportive of the shifts and changes that learning and evaluating through ambiguity requires, able to shape the contexts that enable further development?

### **Nurturing the creative, innovative and entrepreneurial mindset**

14. The concept of the wide definition of entrepreneurship is generally considered to be the precursor to the development of the more narrow definition, which is to say that opportunity identification is reliant on a more innovative and creative mindset, that being action oriented is a precursor to business development, self-reliance precedes self-employment and venture creation and that overall, a combination of all of the above is needed to enhance business growth.

15. Whilst extensive research into the personality traits of the entrepreneur suggest that they have more of an indirect than a direct impact on the growth of a firm (Baum and Locke, 2004), the characteristics of the entrepreneur, such as their educational background (Sapienza and Grimm, 1997), industry experience (Baum et al., 2001), and prior work experience, including entrepreneurial/start-up activities, are acknowledged to have direct effects on sales and employment growth of new firms (Gilbert et al., (2006).

16. However, all of these are reliant on the entrepreneurial mind that is driven by an ability to be an adaptive, curious learner who seeks out new opportunities, perhaps by challenging norms and seeing multiple, not singular solutions to problems. Indeed, whereas teaching to the test has often been the norm, teaching to the behaviour and actions that enable learners to respond to changing goals and shifting scenarios becomes more appropriate than responding to learning through written tests and examinations. For example, if the student always has a set target with a clearly defined pathway through which to achieve it, he/she will not be offered any opportunity to respond in a flexible and adaptable way, simply because the situation has not demanded the behaviour.

17. Although we are primarily discussing in this paper education in schools, the work of Jones (2011, 2014), which considers the teaching of undergraduate and post-graduate students in higher education offers some useful insights. Through the notion that the entrepreneurial student has to be a "reasonable adventurer", which is to say that they have to be able to reason and to act upon reasonable decision-making processes, two premises arise: (i) the student has to be able to demonstrate that they can act on the information they have to hand, and (ii) they have to be able to articulate the reasoning behind their actions, irrespective of success or failure. Both are closely linked to creative thinking. In this context, knowledge retention is required to act – based on what the student already knows through prior work or experience and importantly, can call to mind when needed. This in turn assumes that recollection is efficient, because the student has engaged with prior learning and found it useful enough to retain – usually through some kind of emotional engagement and relevance to their own motivation (Blakemore and Frith, 2005). Fun, relevance and above all creative role-playing can enhance creative thinking, yet it is often considered to decline as schooling develops.

18. In any given opportunity-driven scenario, the student also has to be able to be a quick and efficient "knowledge harvester" (APPG, 2014), not only in order to respond to latest developments in fast changing environments, but also in order to take on board new facts and factors that had not previously been considered, for example as in target audience characteristics or even the learning of

new skills that they have reasoned will enhance their opportunity to succeed. Creativity, self-reliance, opportunity recognition, and initiative taking require the teacher to take on the role of the facilitator, not merely the "teller of truths". Novelty surprises, it does not come in pre-determined forms that the educator has conveyed.

19. The learning environment plays an important role in developing "reasonable adventurers" and "knowledge harvesters"; learning that takes place outside of the classroom can be brought into play, too. Perhaps this can be through insights collated during intense periods of thought and reflection, whether they be through a hobby or internship, it is the learning that is important, not merely the final outcome. If we extend this thinking and merely ask people when they have their best ideas, invariably these will be in periods of relaxed cognition (Claxton, 2008) such as mowing the lawn, walking the dog or even when in the shower. Understanding personal creativity, and the periods in which the mind is best placed to come up with new and innovative insights, should also inform the curriculum and its development. To illustrate this, consider a time of argument when a tense environment led to ill-considered comment, whereas once home, the "why didn't I say that instead" solution comes more easily to mind.

20. The World Economic Forum (Volkman et al., 2009) suggests that the earlier people are exposed to entrepreneurship, the more likely they are to become entrepreneurs. It follows that the earlier external stakeholders become engaged, the earlier meaningful local and international perspectives can be taken into account. To this end, teachers continuously scan their own and the school's networks for opportunities to enhance learning through the exploration of real and relevant issues. If a school can maximise the potential of networks that include local national or even international perspectives, and can embrace the whole school approach where teachers, principals and pupils interact with external stakeholders, then this can be mapped and achievement recorded. Successful schools and colleges will receive recognition in the same way as their students will, as over time and with careful management, confidence will develop that enables the education community, in partnership with the broader community, to match the requirements of an entrepreneurial world - where uncertainty is the only certainty.

21. The value creation concept of entrepreneurial activities – as argued, amongst others, by Lakeus (2015) and Sagar (2015) – is upheld here as the notion of developing novelty through the initiative of the value creator, and the inherent motivational constructs of being happy and engaged learners are considered key elements. However, in the context of our discussion, short-term value creation, which is easily measureable, has to give way to longer-term objectives, such as capability development and business engagement, or at the very least community engagement and an appreciation of what that community needs to develop and thrive. As schooling develops, these can be incrementally more complex and engaged, though it must be remembered that at the root of all entrepreneurship is ideas generation and opportunity awareness, as without these there is no business to develop.

### **Taking into account educational constraints and challenges**

22. There are concerns that educational constraints such as normalisation through standardised testing and pressures on teachers to reach imposed targets has have led to the demise of creativity in both teaching and learning (Jeffrey and Woods, 2003; Grainger et al, 2004). For example, Kyung Hee Kim describes a "steady and persistent decline" in the creative capacity of pupils in US schools between the years 1990 and 2008 (Kim, 2011, p. 289-290). Kim proposes that the decline may be linked to standardisation processes and an overly constructed activity and content approach to learning, where pre-determined measures enable more easily checked cross evaluations of performance. These are aspects that clearly need to be addressed, as they impact on motivation and

intent. Thinking flexibly, critically and creatively are traits that we wish to engender in entrepreneurial education. As said above, setting clear, concise and easily comparable targets diminish the learner's opportunity to develop such skills.

23. Further, consider that when adopting positivistic stances by, for example, setting predetermined goals that predict future success, we may also be inadvertently killing the very achievement that we are wishing to develop. A person's life goals, especially if only focused on financial gain, can actually limit achievement according to Burton and King's (2003) article *The Hazards of Goal Pursuit*. Moreover, more recent research indicates that because the brain is inherently designed to resist change, especially as children get older, the fear of failure factor can actively demotivate the learner and be counterproductive (Ordonez et al., 2009). This reinforces the views made here, as brain plasticity and brain development has a physical dimension; simply put, brain growth is dependent on experience and reward mechanisms, and if the learning is not rewarded, perhaps by being told that something is wrong as opposed to more diplomatically being told that it is a useful alternative that requires further consideration, then the activity will most likely decline. In consequence, due to the lack of use, the neural networks that support these types of thinking simply die off. For a detailed discussion see Penaluna et al. (2014). We will discuss later in this paper the desire to learn through what we describe as "glorious failure", that is, a situation in which the learning is rewarded, even if it is not an exact fit to the anticipated response.

24. To amplify the above, it is widely accepted that young learners, predominantly because of their lack of concern over failure, are more creative. This perspective is further supported by research into brain growth and development. For example, the continuously evolving brain is often termed "plastic" because it is constantly changing in terms of its ability to find new connections when thinking. This connectivity is physical, and reliant on factors such as emotional responses to success and failure, as well as through simple experience. It is less well known that the developing brain prunes itself to save energy when areas fall into disuse, and that post puberty it only actively protects areas that are in active use following this pruning (Immordino-Yang and Damasio, 2011). Accordingly, post puberty, students are much more conservative in their thinking styles and unless creativity exercises are regular and enjoyable, creative capacity will decline. Simple awareness activities that help to make more sense of environments are important in terms of developing new neurological connections, so sense making out of confusion becomes an educational goal (Moon, 2004).

25. This clearly impacts not only on our learners, but also on the teachers. Kneller (1965: 77) asserted that "one of the most justifiable charges that can be levelled against our education system is that it has neglected, all too often suppressed, the natural creativity of the young". As it is generally acknowledged that creativity requires classroom environments and educator behaviours where the educator is a facilitator as opposed to a knowledge provider, understanding how young people think and how the brain evolves is extremely useful to know (Dweck 2006; Langer 1997; Sawyer 2004; Scardamalia and Bereiter 2006).

## BELIEVE IN IT

### Introduction and key issues

26. It is often observed that (young) learners need to see the relevance of what they learn in school in order to see benefit, and from this, are more motivated to learn more. The discussions on brain structure and development actively support this premise, so making it real and making it relevant to the student take centre stage.

27. What aspects of entrepreneurship education are teachers most confident to deliver, and unless they have prior business experience, how might they also learn to learn for themselves? These questions led the European Commission to advise that, "Every student teacher and existing teacher should benefit from at least one experience of training on the key topics and methods related to entrepreneurial learning and entrepreneurship education during their career" (European Commission, 2013, 3). The next question then arises, what should teachers learn and who might they learn it from?

28. Ideally teachers should experience entrepreneurship themselves and have an internship in a business (European Commission, 2009) so they can better communicate using real experiences and engage businesses, in particular SME's, to ensure a relevant curriculum is developed (European Commission, 2013b). The WEF Global Education Initiative report (Volkman et al., 2009) suggests that multidisciplinary business content and experiential approaches should be integrated into the basic training that teachers receive, observing that the effort for "training the trainers" may be as great as developing the curriculum. Perhaps key here is the multidisciplinary tone of the recommendation, because not only is entrepreneurial learning appropriate to almost any school subject, it is also reliant on a good understanding of business and society need.

29. Role models from businesses who join classes bring the studies to life, especially so if they share their failures as well as their successes. For example, the Welsh Government has a role model programme whereby entrepreneurs from the region are funded to join schools, colleges and higher education institutions to share experiences. The role models receive training before they join classes and base their presentations, on the ACRO model (Attitudes, Creativity, Relationships and Organisation).<sup>5</sup> This mature initiative was introduced in 2004 as a component of the Welsh Government Youth Entrepreneurship Strategy. It should also be noted however that someone from the local community, especially someone who attended the school are often valued more than a high profile celebrity, with whom there is frequently a "power distance" disconnect (Hofstede, 1991), and is therefore less inspirational.

30. Besides the above mentioned relevance of the teacher in enhancing creative thinking, the teacher also plays a role in enhancing technical capacity related to entrepreneurship. This can include helping pupils and students through running a start-up company. Opportunities such as the global *BizWorld* programme for primary school children, aged 11-12 years, offer insights into how this can be achieved (see Huber et al., 2012 for an evaluation of the programme in the Netherlands). Jenner (2012) observed that between 15% and 20% of students who participate in a mini-company programme in secondary school will start their own business, a figure that is three to five times that for the general population, so this approach, or something similar and pertinent to the learners, is well worth considering.

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<sup>5</sup> <https://business.wales.gov.uk/bigideas/understanding-entrepreneurship-acro-model>

31. Examples from innovation-driven countries that demonstrate entrepreneurs learn best with an experiential learning approach include Singapore (Tan and Ng, 2006); Sweden (Rasmussen and Sorheim, 2005) and United Kingdom (Raffo et al., 2002). There is less evidence that business planning and business procedures learning generates nor motivates entrepreneurial endeavour (e.g. Jones et al., 2013), but is nevertheless a valuable contribution to the learners' understanding of essential aspects such as financial break even points and the value of market research. But what of the context of learning, and where in any given school is the business expertise and experience appropriately aligned with education imperatives. Simple examples such as managing personal finances can assist here, as funding, buying and perhaps even selling can help to make financial decision-making more believable, not only through the actual handling on money, but also through the personal decision-making process and associated value mechanisms.

32. This section considers issues of relevance to the teacher, their learners, the community and the networking that will support development. The section looks outward for support and inward for change that responds to the discoveries made – resulting in ever changing environments where nothing ever stays quite the same.

**Table 2. Key issues and questions for teachers, school principals and policy makers**

Key issues	Questions
<ul style="list-style-type: none"> <li>• Make learning relevant to the life-world of the learner</li> <li>• Encourage and map networking</li> <li>• Consider persona profiles – map the project to potential buyers</li> <li>• Facilitate learning through motivational understanding</li> <li>• Develop learner-centred / learner determined approaches in the curriculum</li> <li>• Always think "team venture" and engage external thinking</li> <li>• Practice what you preach / be a role model</li> <li>• Make the learner curious</li> <li>• Consider what educator and manager development is required</li> </ul>	<p>Are <b>teachers</b> making connections and linking new knowledge to the student experience, motivating pupils and students to become curious, active and engaged learners who see the relevance of their learning, presenting themselves as co-learners who act in entrepreneurial ways themselves – so as to be role models too?</p> <p>Are <b>school</b> principals supporting the networking imperatives, enabling the mapping processes that evidence the strategic developments required, actively managing the innovative environment of learning?</p> <p>Are <b>policy makers</b> developing policies that encourage communities and schools to work together, encouraging communication strategies that support 'whole community' learning?</p>

Source: Authors.

### **From Pedagogy to Andragogy, and onwards to Heutagogy**

33. Let us start from the assumption that many educational establishments consider learning in terms of content delivery, as opposed to learner generated interest and development. They set a curriculum and work to it, ensuring that no content is missed out if at all possible. This is the traditional domain of pedagogy – predetermining what the learning outcomes will be and filling all the perceived gaps on behalf of the learner. This approach, however traditional, instils a reliance on the system as it does not empower the student to develop their own learning independently. From an educator's perspective – and whilst bearing in mind there are philosophical debates remaining on these definitional stances – this thinking takes the educator from pedagogy, where the educator defines the learning and sets the tasks, toward andragogy, where there is a degree of self-determination on behalf

of the student. This is an important factor to consider, because self-direction increases motivation and can be used to demonstrate self-reliance and the ability to spot opportunities for students' own learning – a necessary skill in business development and growth.

34. Ultimately we wish to develop adults who can become entrepreneurs and who can act confidently for themselves in situations of ambiguity and risk. So to take this discussion a step further, in *The Modern Practice of Adult Education* (1970), Knowles defined andragogy as "an emerging technology for adult learning", with four andragogical assumptions that have impact. They (i) move from dependency to self-directedness; (ii) draw upon their reservoir of experience for learning; (iii) are ready to learn when they assume new roles; and (iv) want to solve problems and apply new knowledge immediately.

35. Often defined as, "the art and science of helping adults learn," andragogy has come to be understood as an advanced alternative to pedagogy; a *learner-focused* approach for people of all ages, hence although it was originally developed for adult learners, it may well have found another home in entrepreneurial education.

36. The heutagogical stance takes things further, as it aims to create individuals who are highly autonomous and capable self-determined learners (Blaschke, 2012, Jones et al., 2014). This could be described as the entrepreneurial educator's ultimate goal – to develop self-reliant students who see opportunities in problems for themselves, and have the means to develop their own approaches in order to maximise value creation.

37. We can see that within this conceptual progress from pedagogy to heutagogy, "knowledge giving" by an expert becomes out-dated, because the ever changing and restructuring of community processes and associated workplaces requires the development of knowledge sharing skills, not simply retention. This echoes King's (1993) observation that an educator has to be more of a "guide on the side" than a "sage on the stage", because one of the main aims of the approach is to help to develop learner confidence and self-efficacy – to better enable them to do things themselves, as well as to simply understand. This, in turn, means the educator acts more as a coach or facilitator, suggesting and guiding the student rather than merely lecturing and giving instruction. For a content driven environment, where the teacher is normally evaluated on what content they create and how they manage the delivery, this may be a significant challenge.

38. Moreover, as heutagogy and its concept of self-determined learning, introduces the potential for more learner led approaches, the strategy assumes that the immediacy of learning requires the educator to take into account that previously understood and static knowledge may no longer be valid in new and changing contexts, and that the clean receptive mind is not the starting point for learning. Reflective cycles of learning (Schoen, 1983) and context/scenario-driven learning, where learners respond to problems found within contexts, will better enable learners to develop skills in "knowledge harvesting", as opposed to mere knowledge retention.

39. To reiterate, and to illustrate how this kind of thinking helps educators to understand their role when developing capable entrepreneurial thinkers who can set up, manage and grow new ventures with confidence and awareness, pedagogy is teacher-centred and teacher oriented, andragogy is more learner-centred. Finally, heutagogy is student-determined objective setting that is developed as a result of being opportunity aware. These metrics also impact on policy makers, as unless policy makers are aware of these different dimensions of educational strategy, they may not be able to meaningfully evaluate what is happening in the schools and colleges.

## **Capacity building across traditional boundaries**

40. Hence, for those tasked with developing the agenda, whether it be teachers, school managers or policy makers, it is the capacity building aspects that needs to be considered above all else. Key questions are: What do those tasked with working at the chalk face of education need to understand? What experience do they need and what support is there for the necessary change? Moreover, what skills do school principals need to facilitate this change?

41. Discussions within schools or colleges often neglect the sharing of expertise across traditional boundaries as a key element of effective capacity building. The teacher and their managers are placed in a unique exchange space. The facilitation of such exchanges is recommended, because many of the skills and experiences will come from "in house" connections and discussions. This is illustrated through the need to develop capacity across all subjects, wider communication across the school and connections with the needs of the local community. It also responds to the networking capacity of the teaching and learning team, because projects and assignments based on real and relevant problems have most impact. Stakeholder mapping and network charts that evolve and develop are good examples as to how, whether in teams or through individual engagement, a school can evidence the iterative building of relationships.

42. It is very important to take into account that the majority of new ventures are created in teams as opposed to being created by individuals (Klotz et al., 2014). This requires both the educator and the principal to develop opportunities that engender behaviours and competencies associated with good communication, open mindedness, leadership and contribution awareness. The team could well extend beyond student cohorts and engage external networks and specialists, for example, learning assignments could be developed in partnership with local communities and enterprises where the external influences are integral to the learning.

43. Practical experience of team working can be gained also through practices within the institution, for example with learners being responsible for the running of a shop or café, through fund raising activities working with local charities that incorporate the gaining of broader networking skills. Networking remains important, so being able to track and evaluate network enhancement is also an opportunity for some form of learning evaluation. Charting the process visually through for example a map or spider diagram can make this more engaging and fun for the learner, not just the teacher or school principal. Online networking and new technological advances could also play a part, though it is important to clarify that actual discussion has taken place, and that this kind of "friend collection" is not merely an act in itself.

44. Entrepreneurship education researcher Kari Ristimäki (2003) suggested this list, which is intended to highlight the intended empowerment of the learner within entrepreneurial education. Educators are asked to answer the following questions. If the answer to most of these questions is "the learner", the activity may be considered entrepreneurial education. The reader is invited to answer the questions in Table 3 for his/her own classroom experience.



**Table 3. Checklist for teacher-student collaboration in entrepreneurial education**

Key questions	Responses	
<b>Who takes responsibility for the activity?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who generates ideas?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who plans the activity?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who selects the ideas to be implemented?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who strives to reach the goal?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who gains experience?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who takes risks?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>
<b>Who practices collaboration skills?</b>	Student	<input type="checkbox"/>
	Teacher	<input type="checkbox"/>

Source: Adapted from Kari Ristimäki (2003);  
[http://www.opinkirjo.fi/en/activity/entrepreneurship\\_education/what\\_is\\_entrepreneurship\\_education](http://www.opinkirjo.fi/en/activity/entrepreneurship_education/what_is_entrepreneurship_education)

### **On engaging parents, roles and role models**

45. There are often stakeholders within the school environment who are willing to support students' progress, but frequently they feel outside of the system and that any personal intervention is inappropriate, whereas the opposite is probably true. Engaging an entrepreneurial parent, who runs their own business and could set projects, could extend to being involved in assessment. Their shared experiences could not only provide benefit to the school, but also to the community at large. For example, a parent with a small local shop that sells groceries could ask students to consider what new products could go onto the shelf, or offer insights into what sells most and what doesn't, and for what reason. A local garage owner could explain how difficult it is to recycle car tyres, and ask learners to offer alternatives to landfill that make better use of the day-to-day product that everyone takes for granted.

46. This in itself introduces an interesting dynamic as amongst the many factors that influence venture creation as a choice, the most prominent factor is that having an entrepreneur as a parent, increases the probability that a child will be an entrepreneur by a factor of 1.3 – 3.00 (e.g., Dunn and Holz-Eakin, 2000) with Lindquist et al. (2015) observing that parental entrepreneurship increases the probability of children's entrepreneurship by 60%. Evidently, the addition of an entrepreneurial teacher who is connected to the local community and its business ventures could therefore offer enormous opportunities beyond the transfer of information.

47. "Are You Ready" is an inspiring example of an education programme primary and secondary level education. Ready Unlimited, a not-for-profit social enterprise in Rotherham/UK, runs this

programme through a series of hubs across the country with that aim to improve schools through collaboration with educators, parents and the wider community. Overall, more than 15 000 6-hour enterprise-learning activities were developed, 130 schools reached the standards set and 130 Enterprise Champions were trained. (Box 1).

#### **Box 1. Are You Ready?**

"Are You Ready" is an education programme developed by Ready Unlimited, a not-for-profit social enterprise in the UK. Its curriculum was designed for both primary level and secondary level education with the overall aim of transforming the life and work chances of young people by enabling teachers and other partners to develop learning environments that are relevant to the opportunities and challenges of the 21st century.

"Are You Ready" is available to all young students; it is considered to be an "enterprise entitlement". Learning outcomes are evaluated through "The Big 13", which are presented as a series of evaluative questions. "The Big 13" capture enterprise capabilities identified by education and business leaders as the skills and qualities young people (need in order) to face their future with confidence. These capabilities are life skills that will make young people stand out from the crowd, and also help them understand how their education links to the real world and, ultimately, their future." They include:

1. Team work
2. Risk
3. Negotiating and Influencing
4. Effective Communication
5. Creativity and Innovation
6. Positive Attitude
7. Initiative
8. Problem Solving
9. Organising and Planning
10. Making Ethical Decisions
11. Leadership
12. Financial Literacy
13. Product and Service Design

The initiative has featured strongly in recent UK government reports such as the All Party Parliamentary Group for Micro Businesses 'An Education System fit for An Entrepreneur' (APPG, 2014), England's first review of a continuously developed enterprise curriculum across all levels of education, and the following review by Lord Young on behalf of the UK Prime Minister's office (Young, 2014). A range of workbooks that offer insightful approaches and reinforced the training were also produced and form the backbone of further work. The team's activity made a major contribution to the UK award of Rotherham being its most enterprising city, which in turn was set against an imperative to regenerate a declining city that faced serious changes due to a decline of its manufacturing industries.

*Source* : Ready Unlimited; "Are You Ready" programme.

48. The school principal of Herringthorpe infant school in Rotherham, who participated in a training on the "Are You Ready" programme, reported the evolving success of parent-teacher interaction through Parent Teacher Groups and engagement with local businesses. This she put down to a simple message of relevance: "If the parents and broader stakeholders saw relevance in what the children were learning, then learning continued beyond the classroom into the community. In turn, the community supported the school" (APPG, 2014, 32). Moreover, one of the key aspects picked up in the school's formal inspection report carried out by OFSTED, was that the teachers made good links and connections between different subjects through an enterprise theme, so that the relevance of the

learning was implicit in all topics (OFSTED Inspection Report: Herringthorpe Infant School, 26–27 January 2009, 5).<sup>6</sup>

49. The term "role model" considers two theoretical aspects: the way that people identify with other people that they connect with within social roles, and the matching of psychological and cognitive skills that lead to imitation that is evidenced through patterns of behaviour. The potential of role models to have impact can be extended to whether or not an educator has the ability to practice what they preach, in order to have an indirect impact on the learner.

50. Exploratory studies suggest this to be the case, as do new understandings in neurology. For example, a Dutch study by Bosma et al. (2012) of 292 entrepreneurs in three cities concluded that "next door" role models have more impact than celebrity icons, and act as exemplars and supporters, and that during the post start up stage, family members have significant influence. Moreover, their findings indicated that one third of the entrepreneurs surveyed stated that they would not have started without their role model, and that one fifth would not have continued without role model support.

51. Lindquist et al. (2012) emphasise the role that parents play as role models and experiments in visioning and memory and Blakemore and Frith (2005) suggest that the brain mirrors what it sees. Moreover, motor neurons are believed to translate visual messages that we receive with little effort, which subconsciously lead to mimicking. Observed action is therefore one way of learning, without active teaching in the accepted sense. This supports the hypothesis that role models are important players in the enterprise educator's toolkit, and that teachers who exhibit good role modelling characteristics may well have significant impact on their learners.

## ASSESS TO ASSIST

### Introduction and key issues

52. Whilst the current policy climate is beyond the remit of this paper, it is perhaps worth taking into account the predominant demand for positivistic outcomes in education (Lackeus, 2014, 10). The desire for simplistic, reductionist and easy to measure and predict goal setting may actually be at the heart of some of the issues. This is a considerable barrier to the development and evaluation of, for example, assessment strategies that take into account constructivist theory (Lobler, 2006) and the view of different stakeholders in different contexts. Indeed, in an international university context this has already been reviewed, culminating in the recommendation that assessment strategies need to move beyond the more positivistic business school based approaches toward more innovative and stakeholder-engaged strategies (Pittaway and Edwards, 2012).

53. The issues surrounding assessment have largely been ignored, and thus questions surrounding the "who" does the assessment and how are they equipped to do so have rarely been considered. This has considerable resonance with our paper, as an appropriately aligned assessment strategy, both in terms of formative and summative evaluations of student performance, will continue to impact on how entrepreneurial education is delivered, managed and evaluated by those in authority

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<sup>6</sup> <http://herringthorpejuniors.com/for-parents/ofsted-report/>

over the teaching communities involved. Issues relating to fairness, robustness and comparability to other institutions clearly need to be considered, but when local, country or specialist domains determine these, an acceptance that the context-driven outcomes and associated views of informed stakeholders needs to be taken into account.

54. An educational experience that requires the teacher to build on the learner’s own interests and to develop questions that engage their natural curiosity (Lowenstein, 1994) is significantly different to delivering sequential content that suits the educator’s predetermined plans and outcomes. This approach can be seen as an extension of problem-based learning (Savery, 2006), because the problem can be identified through the learners’ own curiosity about a situation or context. This observation also enhances the creativity aspects discussed previously. But what of the evaluation metrics that schools such as these employ to check both their own and their students’ progress? How do they impact on entrepreneurial intent and school development?

55. Distinctions between "norm referencing", which is to say assessment that compares student performance within standardized tests that are designed to facilitate comparison to standards or averages, and "criterion referencing", which is to say assessment that compares student performance against specific requirements or criteria, are often cited as barriers to contextual development.<sup>7</sup> Assessment of learning within entrepreneurial education has often been held up to be difficult to develop and manage; yet clear strategies exist. These rely on context, alignment to the learning tasks set, an understanding of the distinctions to made between assessing "Implementation" or assessing "Innovation", harvesting expertise, learner self-direction and validity in the eyes of the learners.

**Table 4. Key issues and questions for teachers, school principals and policy makers**

Key issues	Questions
<ul style="list-style-type: none"> <li>• Does the assessment respond to the need for normative or criterion based evidence?</li> <li>• Does the assessment make distinctions between Implementation and Innovation evaluation strategies?</li> <li>• Does the assessment strategy take into account convergent and divergent thinking cycles?</li> <li>• Is the assessment strategy constructively aligned – so that the task matches the evaluation method?</li> <li>• Does the assessment make distinctions between learning about, and learning for being entrepreneurial?</li> <li>• Does the assessment reward ‘Glorious Failures’ where the learning is evidenced through iterative developments such as prototyping?</li> <li>• Does the assessment consider self-evaluation, especially in team working scenarios?</li> </ul>	<p>Are <b>teachers</b> aware of the distinctions required that facilitate validity of student / pupil assessment, able to justify and argue the case for differing types of assessment, able to draw upon the expertise of other stakeholders, undertake assessment that is meaningful, relevant and contextualized to the needs of their learners in way that develops autonomy and self-sufficiency?</p> <p>Are <b>school principals</b> actively supporting different types of assessment according to purpose, facilitating externality and stakeholder engagement and insights, managing the dynamic of criterion and normative output data, engaging alumni to help to review curriculum and progress?</p>

<sup>7</sup> The glossary of education reform makes useful distinctions between norm and criterion referencing here: <http://edglossary.org/norm-referenced-test><http://edglossary.org/norm-referenced-test>; <http://edglossary.org/norm-referenced-test>

- Does the assessment engage thinking and expertise beyond the school or college?
- Is the assessment designed to facilitate self-development and self-direction?
- Is the assessment meaningful, fair and valid in the eyes of the learner?

Are **policy makers** aware of the challenges of teaching in a wide range of contexts when evaluating school and college performance, supportive of educational strategies that require long-term evaluation, supportive of alumni and similar externality / engagement strategies - where schools learn from past students and stakeholders?

### **Aligning the learning to the task**

56. As the above mentioned research into primary school's engagement in the *BizWorld* initiative (Huber et al., 2012) suggests, when looking at both knowledge and skills, non-cognitive entrepreneurial skills are best developed at an early stage and therefore, arguably, are the foundation for all entrepreneurial learning. Of note is the finding of Gutman and Schoon, (2013: 3) for the Education Endowment Foundation that "non-cognitive skills are increasing considered to be as important as, or even more important than cognitive skills or IQ in determining academic and employment outcomes. Indeed there is now growing attention from policy makers on how such 'character' or soft skills can be developed in children and young people".

57. The student dependency on teachers is another point to review here, as an overall aim is to develop confident young people who address new issues as and when they arise. Questions such as these will help an educator to define what is needed, but have to be based in the learners' context to become relevant to them.

- Have learners been given an opportunity to plan, evaluate their learning performance and understood the relationship of new learning to their prior experiences?
- Is "failing fast" encouraged and are learners comfortable with making mistakes and learning from them (Glorious Failures)?
- Is the evaluation of performance clearly understood by the learners, for example do they know if they are working to "Implementation" or "Innovation" assessment criteria, both, or only at certain times during larger scale projects?

58. This discussion has to be set against the pragmatic attempts that are being made to translate entrepreneurship competencies into common a European understanding and approach to learning outcomes for entrepreneurship education (Thematic Working Group; Eurydice, 2012). What is clear is that the "learning in context" issues discussed above have become a central issue. There is also a general consensus that experiential learning, or "learning by doing" with practical projects and activities and integrating real world experience of entrepreneurship is more effective than traditional methods, such as lectures, for developing entrepreneurial skills and attitudes (European Commission, 2008, 2009, Walter and Dohse, 2009).

59. This brings with it issues relating to what can be assessed and how it can be assessed within school structures and regulatory frameworks. The notion of "constructive alignment" (Biggs, 2003) is important here, as we need to think more broadly and consider "fit for purpose" assessment as opposed to, for example, questions that merely revolve around what the learner can remember. More often or not, learning is evaluated through the written word, as opposed to the demonstration of an ability or skill. The argument given often relates to an over subjective response in observed behaviour or difficulties with reliably repeating and comparing the learning to other examples, yet in an enterprising

context, these arguments are at least in part, invalid, because context and change will drive the decision-making process.

60. This is important to consider, as many evaluative processes focus on the retention of knowledge and not on the development and flexibility of it within ever changing environments. Further they also do not respond in an overt way to the satisfaction of external stakeholders. It is the entrepreneurial educators' task to manage learning appropriately and to ask the question if they have designed a learning strategy that wants to talk about entrepreneurship, or one that prepares learners to actually be more entrepreneurial through demonstrable action?

### **Evaluating "Implementation" and "Innovation"**

61. In simple terms, a new idea or new initiative that takes advantage of complex or confusing environments will be by its very nature, unpredictable. This juxtaposes the view that all learning should be measured by "known knowns", that is, through a series of learning outcomes that carefully predict student performance. Learning outcomes therefore need to address the need for process driven evaluation – such as the generation of alternative ideas and the ability to see multiple solutions, as well as an ability to retain knowledge that is measurable against accepted norms and knowns. Making distinctions between learning for "Innovation" and learning for "Implementation" helps to define the dissimilar nature of these learning outcomes. Hence a simple question can assist the teacher here. Is the assessment based on consistent criteria that are well defined and stable (implementation of the known), or does the assessment look to evaluate performance within uncertain environments (innovation)?

62. Articulated as the two I's – "Implementation" (of predictable outcomes) and "Innovation" (of the process of being innovative), these relate to two thinking styles, that of divergent thinking – where the thinker is encouraged to think broadly and widely, with that of convergent thinking – where the thinker is more concerned about eliminating aspects that are unhelpful and focuses deeply on management of existing knowledge.

- **Implementation** – doing things that are determined by others and matching against their expectations
- **Innovation** – producing multiple and varied solutions that respond to change and often surprise

63. The educational approaches that relate to this kind of distinction emanate from the world of design education, yet rarely feature in business-related education. Recent developments in the understanding of brain structure and our ability to think in different ways support this premise, and the table below offers insights into the alternative methods of evaluating student performance.

64. The balance of assessment can also relate to the type and nature of employment or opportunity. For example, if a demand is well known and relates to a known figure within a population, shall we say that a community of "X" requires "Y" number of hairdressers, then "Implementation" might be a more valid evaluation method. However, if there is a high degree of uncertainty, for example in new App developments for smart phones where technology and user profiles are constantly changing, then the "Innovation" evaluations become more pertinent. Simplifying this, we can say that responses based around rules, standards and norms are "Implementation", and responses that look to new and surprising results are "Innovation". The timing and locating of these differing forms of assessment is also a point of discussion, as innovative (divergent) thought precedes the implementation (convergent) required to evaluate performance.

**Table 5. Implementation versus innovation assessment issues**

Implementation – assessment types	Innovation – assessment types
Can the student write and follow a business plan?	Can the student respond positively to short term and ever changing venture environments / do they come up with new ideas in response?
Can the student come up with a good idea?	Can the student come up with multiple ideas that respond to changing circumstances?
Does the student's solution match the expectation of the test or exam?	Does the student's solution surprise through new insights and alternatives?
Does the student respond to the problem identified by the educator?	Does the student identify new problems and opportunities for themselves?
Is the solution correct, finite and complete in the view of the educator / evaluator?	Is the solution part of an ongoing process of prototyping that responds to stakeholder feedback - maybe from outside experts?
Can the solution be easily compared and contrasted to previous work and understandings?	Does the solution offer new insights and potentially challenge accepted understandings?
Can the student adhere to the use of accepted theories and practices when undertaking an assignment?	Can the student experiment and self-define a range of theories that support or argue against their findings?
Does the student follow the rules carefully when developing a solution?	Does the student compare their solutions to rules and adapt accordingly? (Ideas first, rules later?)
Does the solution require significant resource?	Is the solution testable in a lean environment, and is it potentially scaleable?
Does the assessment look to past understandings?	Does the assessment look to support new understandings?
Does the assessment look to past contexts?	Does the assessment consider future and unknown contexts? (Best guesses?)
Does the leadership style in the task (teamwork) require decision-making by the principal?	Does the leadership style in the task (teamwork) require the management of an inclusive decision making process?

Source: Penaluna and Penaluna in this paper.

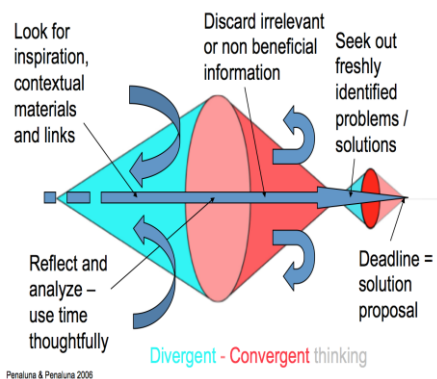
65. In a solution-seeking assignment or project the context and associated problems would be the vehicle on which the assessment would be based. To give an example, the student could be asked to assist the hard of hearing, but only come up with a few contextual links such as hearing aids and written instruction, things that are already common place and hence not very innovative. Another student might block up their ears for a day and come to realize through direct experience that enhanced visual skills are needed, or that other senses such as smell become more pronounced. Therefore through thinking further and wider, the student exhibits more innovative capacity and when it comes to the divergent stage of thinking, will have many more ideas and thoughts to eliminate or consider.

66. This type of thinking develops skills to see things in new ways, in order to develop new products, services or even new and unresolved problems for a business. Once this is undertaken and the learner's mind is full of opportunities, without great concern for perfection or exactness, then the convergent style of thinking is required. Here the full range of ideas can be evaluated against, for example, situations, rules, social norms, ethical considerations etc., etc. The point here is that the more divergent the ideas, the more opportunity there is for more novel solutions to assess and evaluate. Or to think of this visually, the wider the cone of thinking the more alternative thought connections can lead to multiple ideas.

67. In order to meaningfully evaluate innovation that may come about because new problems or issues have been identified, we need to be able to picture the processes involved. The model below

illustrates this principle, and because we are attempting to develop opportunity recognition, this would be a part of an iterative and developing cycle where learning is advanced through the student's own recognition of new problems that need to be resolved within any overarching solution-seeking assignment or project.

**Figure 2. Iterative and developing cycle of innovation**



Source: Penaluna and Penaluna (2006).

68. The unexpected (to the student) cost of existing products, in for example developing countries, could illustrate the fact that freshly identified problems are inherent in a project; so spotting new issues like these would be rewarded, as long as it was the student who identified them and not an over enthusiastic teacher. Now, through self-reflection that has led to self-direction, the student has new problems to consider and new opportunities to look far and wide for solutions, at which point the cycle reverts to convergent thinking that eliminates poor ideas and offers new insights for business opportunities.

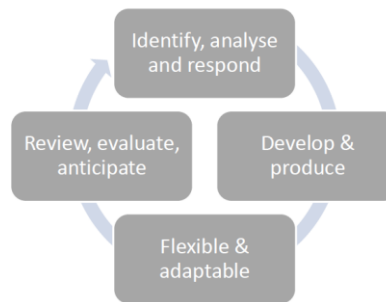
69. Consider the following, who is more creative, the student who can conform to the teaching and learning that has been delivered (and becomes reliant on the process), or the student who finds new ways of looking at things and can independently produce multiple solutions that are distinctly different and varied?

70. Typically, business plans and their associated financial predictions have been the focus of evaluation strategies, but these do not always help to break down this natural cycle of thinking – where innovation leads the process. There is a tendency to focus on getting an idea quickly through a short brainstorming session or two, then focussing deeply on the convergent type of analytical thinking that tests the ideas. In this way, however, lots of good ideas might get lost, as– to paraphrase the late Steve Jobs, co-founder and CEO of Apple – the students start to join up the dots before they have seen all the dots that are available.

71. An example of the Innovation "I" approach can be seen in the UK's Quality Assurance Guidance for the Higher Education sector's approach to the development of learning outcomes for enterprise and entrepreneurship, and can be compared to the table above. According to this, students should be able to (i) identify, analyse and respond to relevant opportunities; (ii) develop and produce multiple solutions to identified problems, shortfalls and similar challenges; (iii) be flexible and adaptable, seeing alternative perspectives and offering a choice of solutions; (iv) and review and evaluate multiple solutions in contexts that anticipate and accommodate change and contain elements of ambiguity, uncertainty and risk (Figure 2).



**Figure 3. QAA Learning outcomes for enterprise and entrepreneurship**



Source: Based on QAA, 2012: 18.

### **Understanding how emotion impacts on learning and performance**

72. Managing and understanding how emotion plays a key part in learning is important, as it helps to understand the management of failure through the perception of prototype development (as opposed to finite solutions). The "relaxed cognition" (Claxton, 2008) theory indicates that the best ideas come when they may not be expected, and are rarely the immediate result of pressurised learning. Neither are good ideas and opportunities spotted in a linear way, but are usually the result of "aha" moments that occur when unexpected, usually when undertaking relaxed tasks such as walking or taking a shower (Kounios and Jung-Beeman, 2009).

73. Learners working on team projects, where they are evaluated for their individual contributions, for example through personal auditing of team member contributions, or group contributions to bigger picture scenarios (or a combination of the two) can act as both trust building experiences and reflective learning opportunities through personal monitoring. This needs to take place in an environment where the learners are encouraged to both challenge and be challenged on their ideas, ideally through concepts akin to prototyping – where the learning is considered as important as the final outcome.

74. The notion of "Glorious Failures" was touched on above, but the premise is worth elaborating upon, and revolves around the simple question as to whether we intend to assess implemented performance, or alternatively, whether learning can be demonstrated to have taken place. To give an example, if students are required to produce multiple solutions in response to a problem that they or their educator has illuminated, then by the very fact that there is more than one answer suggests variable alternatives that, to some degree or another, will be perceived to be wrong. Thus through reflection and comparison and contrast, deep as opposed to surface learning can be evidenced, because the alternative choices are the goal, not a singularly correct outcome.

75. The teacher can also create conducive learning environments through methods such as those initiated by the school principal of Greenhill Primary, Sheffield, UK. Here feedback is provided in the form of "two stars and a wish". This requires two positive comments on what has been done well (two stars) followed by an issue or element that can be improved upon or should be worked on (a wish). So the negative aspect of "right or wrong" evaluation is turned around to be an overall positive evaluation for the students to learn from. Again it is the process of learning that drive the assessment, not the educator's decision as to whether or not the team has produced a good idea or something "correct".

76. Hence, we see that in order to ensure fit for purpose (constructively aligned) assessment, we have to see past the more traditional styles of evaluation such as examinations and written testing, and

to develop outcomes that have more in common with project work and continuous learning strategies – where formative assessment plays a central role. All of the above could simply be perceived as good teaching, learning and assessment, and thus could also alleviate the perceptions reported by EUCIS – LLL (2013) of teacher disinterest and lack of engagement in entrepreneurship education due to a perceived narrowness of focus.

77. In this scenario, recent discussions on non-cognitive competencies are perhaps misleading, as they create an artificial divide between what is perceived to be thought process driven, as opposed to those that are considered to be trait driven, attitudes or simply not the process of rationalised thought. However, recent discoveries in cognitive neurology are illuminating the more complex thought processes that underpin these actions and behaviours, and this evolving research needs to be taken into account.

78. For example, the Wellcome Trust (2010) is conducting a series of evaluative reviews that explore the strength of evidence as to how neuroscience can improve the quality of education. Their survey of 292 teachers between April 2003 and June 2013 indicated that emerging understandings in neuroscience are having a significant impact on teachers and that 82 percent of those surveyed expressed an interest in how the brain works – in order to enhance their teaching methods. However, there is a cautionary note in the report, as research is in many cases at an early stage of development and many teachers are responding to informal guidance and discussion as opposed to robust and well-considered academic literature. Moreover, three out of four of those surveyed indicated that they lack formal support when developing teaching initiatives based on these approaches, indicating that this is one further avenue of inquiry that could support the entrepreneurial educator’s approaches in what are considered to otherwise considered to be non-cognitive approaches, and that a stronger evidence base in education more generally could better inform policy and understanding (Howard-Jones, 2013).

79. According to the Wellcome Trust, in a previous survey of UK and International educator’s views, nearly 90 percent of the teachers felt that a knowledge of the brain was important or very important when developing learning packages (Pickering and Howard-Jones, 2007), suggesting that this is one avenue of enquiry that will add resonance to this aspect of entrepreneurial educator engagement, motivation and interest.

80. In conclusion, assessment that informs progress, looks to multiple as opposed to singular answers, responds to changing circumstances and is evaluated in context, needs to be more carefully drawn into the teacher's evaluative toolkit. Moreover, principals, those charged with developing the curriculum and policy makers need to take this new thinking into account. Above all it must make sense to learners, because as noted, relevance to their personal situations, networks and teams will have to be paramount.

## **BUILD AND DEVELOP**

### **Introduction and key issues**

81. Ultimately, we wish to develop adults who can act confidently for themselves in situations of ambiguity and risk. We suggested earlier in this paper that teachers should ask open questions that can

have more than one correct answer (European Commission, 2009), so that the thinking wider and broader aspects of learning discussed above can be integrated into classroom activities. Managing these scenarios requires capable teachers, ones who can keep quiet and let students discover answers for themselves. So how does a teacher who knows how to keep quiet at the appropriate juncture get recognition for this ability in the classroom?

82. In this section, we discuss the role of the entrepreneurial teacher as the who can facilitate this through the breaking down of barriers, can act as a catalyst for ideas and can spot the "pain points" where significant problems are apparent – they can mobilise a team to jointly and flexibly adapt to issues and problems as they arise.

**Table 6. Key issues and questions for teachers, school principals and policy makers**

Key issues	Questions
<ul style="list-style-type: none"> <li>• Currently employed metrics in education may no longer be suitable to requirements</li> <li>• Implement or Innovate is as important a concept in management as it is in entrepreneurial teaching</li> <li>• Becoming an agent of change is a viable an outcome that can be evidenced through student and alumni feedback</li> <li>• Agents of Change need to manage change and the creative capital that results; hence insights into intellectual property management become a topic for both teachers and principals to take account of.</li> <li>• Context and environment will determine 'pain points' and necessary actions</li> <li>• Management in situations of ambiguity and risk does not correlate well with management styles developed for stable environments, hence the role of 'guide on the side' extends to principals as well as teachers, as the 'sage on the stage' may not be best placed to respond to continuously changing circumstances and environments</li> </ul>	<p>Are <b>teachers</b> perceived as Agents of Change who facilitate learning, capable principals of learning environments that facilitate intellectual growth and value creation, aware of their role in determining what issues are prioritized and need to be 'managed up'?</p> <p>Are <b>school principals</b> supportive of teaching and learning that doesn't have easily determinable outcomes, practicing innovators and team players, able to manage ever-changing environments and respond to new issues and associated problems, able facilitators of continuous professional development and other educator support?</p> <p>Are <b>policy makers</b> aware of the challenges of limiting evaluation metrics to easily comparable and determinable outcomes, supportive of the model of educators as agents of change as opposed to knowledge retainers and transmitters, able to support contextualized learning strategies - where the adaptability of the principals may be as critical as the adaptability of the learners?</p>

### **Educational leadership and innovative educators**

83. The OECD's *Measuring Innovation in Education: A New Perspective* concluded that innovation and teacher collaboration studies were inconclusive, "direction of innovation has not been consistent across education systems and therefore little can be said on the overall trajectory of change between 2003 and 2011 for OECD countries" (OECD, 2014: 224). This is unsurprising when norms and standardization of curriculum and pedagogy are more deeply investigated. We know how young people learn best, but fail to maximise this knowledge to its full potential by limiting opportunities to practice and explore for one self.

84. Throughout the discussions in this paper we have emphasised the role of teachers in nurturing creativity and innovation through entrepreneurship education. The point should be made here that new and creative thinking is normally protected through IP – Intellectual Property law. For a

teacher, attempting deep understanding of these laws is unrealistic, and they will not have sufficient experience to be able to define exact answers.

85. However, the teacher should develop an awareness of the different types of legal protection. For example copyright is an everyday discussion and protects authors such as writers and musicians from having their work copied without permission. Trademarking of logos and brands is extremely important for real businesses, as are Design Rights that protect 3d objects. Finally, Patenting is arguably the most complex form of IP and requires very specialist advice.

86. Signposting students to sources of information on IP protection should therefore be the teachers' primary goal. Making students aware will help them to develop understandings that may become extremely useful in their later careers, especially if they become innovative entrepreneurs who need to protect their ideas from theft..

87. Management skills are often considered to relate to the ability to be the decision maker – the expert who knows the answers and who has the knowledge to be correct. Whilst this suits a static and stable business environment, the same cannot be true for one where change is constant and more engaged teamwork is required. Educators who are agents of change can be recognised by their impact on the learner and on the school. Moreover, from a school principal perspective, as pupils start to get better ideas, a school-wide policy that manages the process in a competent and rewarding way will most likely become necessary. Successful schools and colleges will receive recognition in the same way as their students will, as over time and with careful management, confidence will develop that enables the education community, in partnership with the broader community, to match the requirements of an entrepreneurial world – where uncertainty is the only certainty.

88. An example of how public policy is systematically supporting schools to introduce entrepreneurial education is SEECEL, the South East European Centre for Entrepreneurial Learning. It was founded in 2009 as independent, non-profit organisation on the initiative of eight South East European countries to promote entrepreneurial education (Box 2).

#### **Box 2. South East European Centre for Entrepreneurial Learning (SEECEL)**

Experts at the South East European Centre for Entrepreneurial Learning (SEECEL) confirmed that “teachers are agents of change, and that schools are the nucleus of change in developing entrepreneurial societies” (SEECEL, 2014). Schools are described as being open to change. Learning to learn through flexibility and partnership is the future of good learning environments and that. Teachers aim to encourage their learners to become self-sustaining ideas generators who see opportunities and challenges that not only make sense to them, but also provide opportunities to seek out new solutions to problems that they have identified.

Four key abilities are established for teachers and school principals. They have to be able to (i) explore, (ii) continuously develop new understandings, (iii) harmonise these understandings and (iv) evaluate or re-evaluate the results in the context of internal and external stakeholder engagement. All of these require excellent communication skills.

SEECEL argues that we need to consider learning through a shift in the locus of control, from centralized and standardized learning outcomes towards learning that is meaningful in context, and from considering learners as dependents on the educator's knowledge toward self-seeking knowledge harvesters who learn through the notion of "glorious failures", which is to say that through meaningful reflection, they learn from their own experiences, errors and shifting understanding of the world in which they will work.

SEECEL has developed for the Western Balkan countries a series of learning outcomes for ISCED Level 3, where students have the choice to either leave education for the labour market, or alternatively to move on to higher levels of education. The work is a result of significant collaboration amongst eight member countries, so

the consensus gathering that has occurred may be useful in other contexts.

Source : SEECCEL (2014).

89. Routine requires well-planned steps and well-defined goals that respond to well understood environments that don't change. Key questions are "Can we divide the tasks and standardize them?" and "Can we hire specialists who can deal with the detailed areas that we define?". Accountability is an easy way to evaluate performance, through questions such as "Have they achieved what I've asked them to do?". This approach is based on management styles developed by Frederick Taylor in 1911 in his book, *Principles of Scientific Management*, and is well suited to corporate environments where prescribed processes and clear responsibilities and accountability enable time and motion specialists to shave off unnecessary wastage. However, the same approach is completely ineffective in environments the learning outcome cannot meaningfully prescribe something that as yet doesn't exist. Not unlike our discussion above, the approach evaluates "Implementation", but not "Innovation".

90. Conversely, consider the fact that new entrepreneurs will disrupt the norms set by others, they will face considerable uncertainty as to whether or not customers will be interested in them or their products and services, and any kind of predictable future is measured in days at best. In this environment, monthly forecasts will most likely be unreliable and unless interim evaluation strategies are in place though continuous prototyping and cycles of testing against customer perceptions, the business or enterprise will most likely fail.

91. In these kinds of environment, the ability to fail fast, to continuously test and evaluate, to lead through consultative actions as opposed to experienced hunches, become the imperatives. This is not a simple case of analysis over time, but more an ability to synthesize through leaps of faith and rapid testing – letting the responses of customers determine the success or otherwise of a project or idea. Moreover, as highlighted by Harvard's Mind behaviour and Brain Group (Zaltman, 2003), new ideas tend to emanate from the mixing of ideas at the boundaries of specialisms, not through deep and silo-based environments.

92. Often led by people who have breadth as well as depth of understanding, again mirroring our previous discussions here, the successful entrepreneurial manager is one who can facilitate through the breaking down of barriers, can act as a catalyst for ideas and can spot the "pain points" where significant problems are apparent, and can mobilise a team effort to jointly and flexibly adapt to issues and problems as they arise. Steve Blank contests that a good business plan will not survive its first encounter with a customer, because new information will disrupt prior thinking, and the entrepreneurial education context is a remarkably similar environment.

93. Hence educational leadership in entrepreneurial education needs a similar style of manager, one who can help to make sense of the diverse and complex environment that educators work within, can act as an empowerment specialist who empathises with the educator and their learners and can offer insights that lead to opportunities to experiment. Above all, more problems equal more solutions, and thus our model is completed, because the more diverse and contextually driven the thinking, the more it will be able to respond to local or relevant issues and local or relevant imperatives.

94. Innovative educators will innovate, but validation of their approaches can only be realistically evaluated and validated by their learners, hence alumni engagement and empowerment to return and advise, completes the education system's own evaluation system. New insights will not evolve from doing the same things that have been done over and over in the past, but can only be generated by change and adaptation.



## CONCLUDING REMARKS

95. We introduced in this paper a model that teachers and school principals can use to review and eventually reorganise entrepreneurship education activities. Ultimately, we wish to develop adults who can act confidently for themselves in situations of ambiguity and risk. What was the situation before, and how has it developed and or changed as a result of the intervention?

96. The model pictures an education system that focuses on (i) Adaptability (to address fast changing problems), (ii) Opportunity recognition and networking (to address complex and interlinked issues), and (iii) Sustainable teaching that develops businesses who address the needs of others (it isn't all about the money, it isn't always about "me").

97. Opportunity identification is reliant on an innovative and creative thinking, which is a precursor to entrepreneurial development. If the learner isn't offered any opportunity to respond in a flexible and adaptable way, they cannot demonstrate the behaviour. Clear goals can sometimes be counter-productive because the student has to be able to act on the information they have to hand, and they have to be able to explain the reasoning behind their actions, irrespective of success or failure; it is fundamentally linked to creative thinking. Fun, relevance and above all creative role-playing can enhance this opportunity, yet these activities tend to decline as schooling develops. Knowledge harvesting skills become as important as knowledge retention skills.

98. In unpredictable learning situations learning cannot be measured by standardized "known knows". We must think about two thinking styles, that of divergent thinking – where the thinker is encouraged to think broadly and widely, with that of convergent thinking – where the thinker is more concerned about eliminating unhelpful aspects. Based on this, we presented in this paper two points of focus for meaningful assessment. These are: "Implementation" – doing things that are determined by others and matching against their expectations, and "Innovation" – producing multiple and varied solutions that respond to change and often surprise.

99. The successful entrepreneurial teacher the is one who can facilitate this through the breaking down of barriers, can act as a catalyst for ideas and can spot the 'pain points' where significant problems are apparent – they can mobilise a team to jointly and flexibly adapt to issues and problems as they arise. New insights will not evolve from doing the same things that have been done over and over in the past, but can only be generated by change and adaptation, and the understanding that more problems = more opportunities to develop innovative responses.

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